5G : A Superpower Over 5G WIFI

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ABSTRACT
This paper proposed that in coming future 5G will overcome 5G WiFi and will be comefront as Superpower. It also compare and explain features of two tecnologies for delievering broadband wireless internet access services: 5G vs 5G wifi. The former refers to fifth generation mobile technologies and later 5G WiFi refers to 802.11 ac wireless Ethernet standard that was designed to support wireless LANs. Although the two technologies reflect fundamentally different service, industry, and architectural design goals, origins, and philosophies, each has recently attracted a lot of attention for future as people are in need of most efficient, feasible and cheap technology, for which, 5G is proving a forthcoming popular boss for all technologies.

Keywords:
5G, 5G WiFi, 802.11 ac.

1. INRODUCTION

The explosive parallel growth of Internet and mobile telephone services are two most important factors impacting telecommunication over the past decade. The Internet provide people with benefit of data communication modes like email, the web and e-commerce while mobile service makes them to be approachable from anywhere, at any time. The Internet makes it possible to transfer data with voice as the data sharing is increasing now days. These benefits of multimedia services are coupled with flexibility and mobility of wireless but to access its full potential, we need broadband access connection i.e. it should support data rates in hundreds of kilobits per second. Mobile wireless industry [1] has started its technology creation, revolution and evolution since early 1970s. In the past few decades, mobile wireless technologies have experienced 4 or 5 generation of technology revolution.

The goal of this paper is to find out whether the upcoming 5G technology will prove to be an end to 5G WiFi(IEEE 802.11 ac) by comparing and contrasting the features of two technologies: 5G and 5G WiFi. Traffic on wireless network has been doubling annually and around 2020, data consumption will be thirty times more. Current 4G technology will not be capable of carry this rapid increase of data consumption. In reality, 5G does not exist yet but the future network next to 4G we say is 5G. 5G networks will not be only provide more speed but is also capable of carrying data. On the other hand, WiFi has also brought a new aspect in ground of networking. The broadcast of data is completed via radio waves and enable a user to get access to internet anywhere in the location. Here, we will not discuss the relationship between various transitional or 2.5G mobile technologies such as GPRS or edge nor will we discuss the myriad possibilities for 4G mobile technologies. Our goal is to find out whether the speed, technology and feasibility of 5G will overcome our existing latest 5G WiFi i.e. WiFi ac or 802.11 ac. Speaking broadly 5G offers a vertically-integrated, top-down, service provide approach to delivering wireless internet access while WiFi occurs an and end-user centric, decentralised approach to service provisioning. We believe that the wireless future will include a mix of heterogeneous wireless access technologies and moreover, we also expect that two world views will converge such that vertically integrated service providers will integrate WiFi or other WLAN technologies into their 5G.

The work is as organized as: In section 2, the author explain history and working of both 5G and 5g wifi. In section 3, the author is analysing different features of these technologies.Section 4 propsing 5G as a superpower over 5G. Finally, section 4 concludes the paper.

2. 5G WIFI AND 5G

(i) WiFi is a wireless networking technology used across the globe and is a way to allow collections of PCs, terminals, and other distributed computing devices to share resources and peripherals such as printers, access servers, or shared storage devices. It refers to any system that uses the 802.11 standard, which was developed by the Institute of Electrical and Electronics Engineers (IEEE) and released in 1997. A wireless network uses radio waves, just like cell phones, televisions and radios do. The 802.11x families of Ethernet standards are for wireless LANs [2]. WiFi LANs operate using unlicensed spectrum in the 2.4GHz band. The current generation of WLANs support up to 11Mbps data rates within 300 feet of the base station. Most typically, WLANs are deployed in a distributed way to offer last-few- hundred-feet connectivity to a wireline backbone corporate or campus network. Typically, the WLANs are implemented as part of a private network. The base station equipment is owned and operated by the end-user community as part of the corporate enterprise network, campus or government network. In most cases, use of the network is free to end-

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users (subsidized by the community as a cost of doing business, like corporate phones). Figure 1 shows the evolution of generations of 802.11 standard [3].
802.11ac is the newest standard as of early 2013 [4]. It has yet to be widely adopted, and is still in draft form at the Institute of Electrical and Electronics Engineers (IEEE), but devices that support it are already on the market. 802.11ac is backward compatible with 802.11n (and therefore the others, too), with n on the 2.4 GHz band and ac on the 5 GHz band. It is less prone to interference and far faster than its predecessors, pushing a maximum of 450 megabits per second on a single stream, although real-world speeds may be lower. Like 802.11n, it allows for transmission on multiple spatial streams -- up to eight, optionally. It is sometimes called 5G WiFi because of its frequency band, sometimes Gigabit WiFi because of its potential to exceed a gigabit per second on multiple streams and sometimes Very High Throughput (VHT) for the same reason.

Figure 1: Generations of 802.11

(ii) 5G
5G is the upcoming latest technology for mobile service providers. Mobile services are provided by service providers that own and operate their own wireless networks and sell mobile services to end-users, usually on a monthly subscription basis. Mobile service providers use licensed spectrum to provide wireless telephone coverage over some relatively large contiguous geographic serving area. Historically, this might have included a metropolitan area. Today it may include the entire country. From a users perspective, the key feature of mobile service is that it offers (near) ubiquitous and continuous coverage. That is, a consumer can carry on a telephone conversation while driving along a highway at 100 Km/hour. To support this service, mobile operators maintain a network of interconnected and overlapping mobile base stations that hand-off customers as those customers move among adjacent cells. Each mobile base station may support users up to several kilometers away. The cell towers are connected to each other by a backhaul network that also provides interconnection to the wirelessc Public Switched Telecommunications Network (PSTN) and other services. The mobile system operator owns the end-to-end network from the base stations to the backhaul network to the point of interconnection to the PSTN (and, perhaps, parts thereof).Figure 2 shows the core network depicting network connections.

The first mobile services were analog. Although mobile services began to emerge in the 1940s, the first mass market mobile services in the U.S. were based on the AMPS (Advanced Mobile Phone Service) technology. This is what is commonly referred to as first generation wireless. The FCC licensed two operators in each market to offer AMPS service in the 800-900MHz band. In the 1990s, mobile services based on digital mobile technologies ushered in the second generation (2G) of wireless services that we have today. In the U.S., these were referred to as Personal Communication Systems (PCS)8 and used technologies such as TDMA (Time Division Multiple Access), CDMA (Code Division Multiple Access) and GSM (Global System for Mobile Communications). From 1995 to 1997, the FCC auctioned off PCS spectrum licenses in the 1850 to 1990 MHz band. CDMA and TDMA were deployed in the various parts of the U.S., while GSM was deployed as the common standard in Europe.9 The next or Third Generation (3G) mobile technologies will support higher bandwidth digital communications and are expected to be based on one of the several standards included under the ITU's IMT-2000 umbrella of 3G standards. Then comes the fourth Generation. The internet speed of 4G mobile service is 100MBPS (21 MB per second), when compared to the low speed of 21MBPS in 3G mobiles. Other mobile companies are also planning to make 4G services available. The companies namely Reliance infotel and Qualcomm have got licence to make the 4G service available in Kerala.

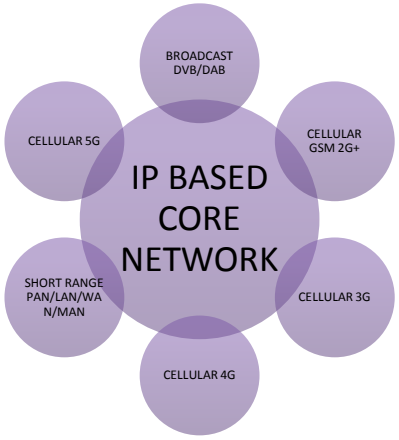

Figure 2: Core Network showing network connections.

A new revolution of 5G technology [5] is about to begin because 5G technology going to give tough completion to normal computer and laptops whose marketplace value will be effected. There are lots of improvements from 1G, 2G, 3G, and 4G to 5G in the world of telecommunications. The new coming 5G technologies is available in the market in affordable rates, high peak future and much reliability than its preceding technologies. Features that

are getting embedded in such a small piece of electronics are huge. Until the controversial spectrum scams were brought up in the limelight many were ignorant of what 1G, 2G or 3G stood for and all of a sudden a hike was found out amongst laymen so as to be knowledgeable about it. Still a number of people are unaware of 1G or 2G when the world has moved on to 4G. In the present time, there are four generations in the mobile industry. These are respectively 1G the first generation, 2G the second generation, 3G the third generation, and then the 4G the fourth generation. Ericson a Swedish company is launching this high tech featured mobile into the market. It is being first introduced in the Swedish Capital city, Stockholm.

3. FEATURE ANALYSES BETWEEN THESE TECHNOLOGIES

Figure 3 shows the analysis of different features between 5G and 5G WiFi (802.11ac). 5G technology offer high resolution for crazy cell phone user and bi-directional large bandwidth shaping.The advanced billing interfaces of 5G technology makes it more attractive and effective. It also providing subscriber supervision tools for fast action. The high quality services of 5G technology based on Policy to avoid error. It is providing large broadcasting of data in Gigabit which supporting almost 65,000 connections. It offer transporter class gateway with unparalleled consistency. The traffic statistics by 5G technology makes it more accurate. Through remote management offered by 5G technology a user can get better and fast solution. The remote diagnostics also a great feature of 5G technology. It is providing up to 25 Mbps connectivity speed. The 5G technology also support virtual private network. It will take all delivery service out of business prospect The uploading and downloading speed of 5G technology touching the peak. The 5G technology network offering enhanced and available connectivity just about the world.

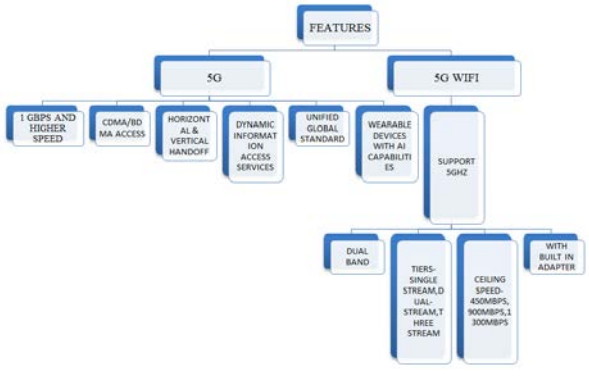

Figure 3: Features of 5G and 5G WiFi Technology

802.11ac promises data rates of up to 1.73Gbps between an access point and a wireless client. 802.11ac is now being termed by some as "5G WiFi - the 5th generation of Wi-Fi [6]. IEEE 802.11ac will be the world's fastest and most reliable Wi-Fi standard for consumers and enterprises, designed to meet the explosive growth in content consumption, and the proliferation of wireless devices. Some of the goals of 802.11ac include improved link reliability, faster throughput - to support apps such as streaming video content to Internet / Smart TVs, phones, tablet and PCs, higher capacity- to support more wireless devices, which may also be in more "dense" environments, broader coverage- to extend range of operation from the AP (at a given data rate), with fewer "dead spots" or areas of poor coverage and longer battery life- by sending and receiving data faster, wireless devices will lose less battery power to the WiFi adapter [7]. IEEE 802.11ac will deliver very high throughput for streaming multimedia devices, improvements in range, expanded overall system capacity, and network resilience to interference—boosting application performance for any enterprise with a high density of mobile devices. Fortunately, 802.11ac technology can be easily integrated into an enterprise's existing Wi-Fi network and will add the bandwidth to support the influx of new Wi-Fi devices and multimedia rich apps.

4. SUPERPOWER 5G OVER 5G WIFI

5G technology is going to be a new mobile revolution in mobile market. Through 5G technology now you can use worldwide cellular phones and this technology also strike the china mobile market and a user being proficient to get access to Germany phone as a local phone. With the coming out of cell phone alike to PDA now your whole office in your finger tips or in your phone. 5G technology has extraordinary data capabilities and has ability to tie together unrestricted call volumes and infinite data broadcast within latest mobile operating system. It can handle best technologies and offer priceless handset to their customers. 5G Technologies have an extraordinary capability to support Software and Consultancy. The Router and switch technology used in 5G network providing high connectivity. The 5G technology distributes internet access to nodes within the building and can be deployed with union of wired or wireless network connections.

5G Technology [8] stands for 5th Generation Mobile technology. 5G mobile technology has changed the means to use cell phones within very high bandwidth. User never experienced ever before such a high value technology. Nowadays mobile users have much awareness of the cell phone (mobile) technology. The 5G technologies include all type of advanced features which makes 5G mobile

technology most powerful and in huge demand in near future. Figure 4 proposing 5g as superpower of 5G wifi [9].

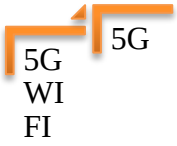

Figure 4: 5G as superpower of 5G WiFi

A user can also hook their 5G [10] technology cell phone with their Laptop to get broadband internet access. 5G technology including camera, MP3 recording, video player, large phone memory, dialing speed, audio player and much more you never imagine. For children rocking fun Bluetooth technology and Piconets has become in market.

So, it can be possible that in coming years with more advance technology 5G will be proved as Super power over 5G wifi instead of its high speed.

5. CONCLUSION

The 5G mobile technology will be implemented at the end of current decade. In this paper, the author explain different mobile technology- cellular and Wifi which we want to include in future mobile network. As 5G is emerging as superpower in mobile technology, facts are proposing that at end of this decay it will overcome the wifi technology despite its speed. As the technology will get more advanced 5G will gain speed access and can be used as both cellular and wifi with the help of hotspots in the same rate as we can get 5G wifi. This mobile technology will offer high data rate, efficient and reliable communication at an affordable rate. Basically this paper shows the technology can be added in the 5G so by this Add on the future technology can become more efficient and helpful for society.

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